

TRAINING TECHNOLOGY

# This Ain't Your Daddy's Firing Range

The question is no longer whether to use simulation to enhance small arms marksmanship, but how much and how often. Simulation is effective and takes less time and less money. **Tom Slear** explains.



FATS small arms trainer.  
Image credit: FATS

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**U**.S. Army Staff Sergeant Hai Clay knows from firsthand experience just how much simulation has changed basic rifle marksmanship. The Ranger qualified infantryman has been working with the Engagement Skills Trainer 2000, or EST 2000, for years. He has witnessed how the system prepares soldiers for live fire to the point that they walk off a firing line with a satisfied smile that says, "I've been through all of this before."

More important for trainers such as Clay, the EST 2000 provides prompt and accurate feedback. Back in the day – that would be 1989, when Clay entered the Army – feedback was mostly guesswork. Drill sergeants looked at the grouping of hits on the target and asked themselves four questions: Did the shooter jerk the trigger? Was the timing of his breathing off? Did he have a correct sight picture? Was his firing position stable?

Drill sergeants would pick one of the four based almost entirely on gut feel and then critique trainees. It was guesswork, the equivalent of offering advice to a runner based solely on his time at the end of the race. The EST 2000, on the other hand, provides an immediate display of an enlarged target showing the shooter's aiming point continuously from two seconds before until two seconds after he pulled the trigger.

"This lets you know whether the problem



Laser Collective Combat Advanced Training System (LCCATS).

Image credit: MPRI

was with the trigger squeeze, whether it was breathing, the computer will tell you exactly what went wrong," says Clay. "It takes the guessing out of it."

But Clay was never more convinced about the value of simulation as it relates to individual marksmanship than when a woman with no military experience and who had never handled a



weapon trained on the EST 2000 for four hours and scored 36 out of 40 on the M-16 rifle qualification course. The course was simulated, which meant the rifle didn't produce quite the recoil of one firing live rounds. Clay estimates the score on a live-fire range at 33, still 10 hits above passing. Any doubts he had about the value of simulated marksmanship training were erased forever.



### The Ground Community Gets It

Within the American defense establishment, the question is no longer whether to use simulation to enhance small arms marksmanship, but how much and how often. For years, old-school infantrymen worried that anything other than full recoil and the pungent smell of gunpowder was a worthless imitation. They have either moved on or become believers because of simulation's two salient attributes – less time and less money.

"The aviation world has embraced simulation for years," says Terry Bennington, a retired Marine sergeant major who now serves as a program officer within the technology division of the Marine Corps' Training and Evaluation Command at Quantico, Virginia. "They saw all of the extra training you could get at such little expense. Only now is the ground community truly embracing simulation. The only thing grunts are interested in is steel on target, but they are slowly realizing that you can do a lot

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more in training with simulation. They are finally getting it."

The Marine Corps uses the Indoor Simulated Marksmanship Trainer (ISMT) that, much like the EST 2000, uses lasers and screens to replicate the ballistics of weapons and the terrain of firing ranges. The basic element of both systems is the lane - one shooter in a static position firing at life-size computer images. The systems are modular, so lanes can be combined to accommodate as many as 10 to 15 shooters side-by-side.

The systems have the capability to generate scenarios that go far beyond basic marksmanship. All the weapons found in an infantry squad from machine guns to shot guns and then some, such as mortars and anti-tank weapons, can be employed. The enemy can vary from a tank-infantry task force with the



Cubic's portable small arms training system - Engagement Skills Trainer 2000 (EST 2000).

Image credit: Cubic

opposing infantry moving in short sprints, never exposing themselves for more than three seconds, to a single sniper concealed in a building adjacent to an urban street. Squads can practice fire distribution and discipline. Individual soldiers can test their reactions in a shoot/don't shoot lane.

But the real hook of these systems is rifle marksmanship. Each year the U.S. military takes in hundreds of thousands of civilians and within nine weeks attempts to indoctrinate them with the military culture and make them proficient in basic combat skills. Rifle marksmanship and physical exercise have traditionally taken up the lion's share of training time because American youth tend to be in poor condition and only a handful from the pool of those interested and qualified for military service have ever handled a weapon.

ISMT, EST 2000 and other systems (there are a number of them used by the American armed forces) provide "the ability to fire more effectively when you get to firing live rounds," says Army Lt. Col. Chris Forbes, the commander of a basic training unit at Fort Benning, Georgia. "Simulation will never replace real bullets, but soldiers can learn the basics of firing accurately from the kneeling position, which is a tough position to fire from, without all of the time and expense of getting to a range and expending rounds. Yes, simulation is a sterile environment, but it gets you the fundamentals so that when the sweat is running down your nose, you have that muscle memory."

The EST 2000 has images of the firing ranges from all five of America's installations where basic training takes place. When the soldiers arrive at the range, they truly have been there before (minus, of course, the cold, the rain, and the dirt).

"I look at the data pretty hard," says Forbes, "and it's clear that those with less time with EST had a tougher time zeroing their weapons and qualifying."

"Let's face it, the weapons are designed for men and we were losing female Marines because of marksmanship," says Bennington. "Now that they have the extra time to practice, it has showed with their marksmanship. No doubt our female Marines can shoot."

#### Everyone in the Same Battlespace

Those involved with EST 2000, ISMT, and others (there are several used by the armed forces) see the future pretty clearly. For one, the shooters will be able to move. Bennington foresees long buildings with screens on both sides that create the reality of an urban setting. As an infantry squad maneuvers through the city "street," it engages enemy snipers, machine guns, and even

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tanks. Hallways that branch off from the main corridor serve as alleyways.

Bennington believes that before then simulation will have to progress through a step where the shooters remain stationary and the scenario moves by them. After that technology matures, it will begin to allow for the shooters to move into the battlespace.

In the meantime, Bennington predicts, there will be a shift in mindset. What started as a means to enhance individual marksmanship will grow into a demand to use simulation for many other ground combat skills. Even now ISMT can handle indirect fire support training, which in its live version is reserved for a handful of designated forward observers because of the prohibitive expense.

The ultimate outcome will have ground simulations moving to higher and higher levels while command simulations move to lower and lower levels. At some point they will merge with everyone in the same battlespace.

But all of that is years away. For now, both the Army and Marine Corps are making full use of marksmanship simulation. The systems have migrated from basic training centers to reserve and National Guard units as well as operational units throughout the world. The plan here, as with all simulation, is desktop availability. Forbes has the soldiers in his unit train when they have spare time on BEAMHIT, a highly portable, relatively simple system that reinforces marksmanship principles.

"All of this will never replace the value of live rounds," Forbes says. "We will always need trigger time with real bullets. But what simulation does is make live fire much more effective." **MS**

#### Editors' Note

For a comprehensive listing of vendors of small arms training devices, visit Halldale Directories at [www.halldale-directories.com/](http://www.halldale-directories.com/). Search under Small Arms Training.

### Marksmanship and Engagement Trainers

Military combat in the 21st century makes unique and critical demands on the marksmanship and engagement skills of dismounted soldiers. Industry is responding and companies are offering new training products or upgrading their most popular ones to enhance the skills of dismounted soldiers. Here is a quick look at a few firms and their products. For a broader look at the industry, visit [www.halldale-directories.com](http://www.halldale-directories.com) and search on small arms training.

- Raydon's Virtual Warrior Interactive (VWI) immerses dismounted warfighters in a 360-degree field of regard via helmet-mounted displays (HMDs). Trainees can interact in real-time with networked convoy, tank, armored fighting vehicle, and helicopter trainers. In particular, the VWI is designed to work with the company's Virtual Combat Convoy Trainer (VCCT) that also features the 360-degree field of regard via HMDs, as well as other convoy operations trainers.

According to Raydon's president, Don Ariel, the purpose of the VWI is to increase the realism of mission training, particularly in convoy training. Through the VWI, soldiers will be able to conduct training missions in exact virtual replicas of the terrain of Baghdad, Tikrit, Samarra, Kabul and other areas where US forces are being deployed. The aim of the system is to allow soldiers to practice and refine battle drills for building clearance, dismounted patrols and other necessary skills. ([www.raydon.com](http://www.raydon.com))

- LaserShot, Inc., offers several marksmanship trainers that employ laser technology. The US military currently uses more than 450 Military Skills Engagement Trainers (MSET-6000). The company also offers the portable version of this trainer, the MSET-5000. In addition to the laser marksmanship trainers, the firm also produces live-fire training systems, including the Livefire Simulator Trainer and shoothouse trainers that have been employed by several law enforcement agencies. ([www.lasershot.com](http://www.lasershot.com))

- Firearms Training Systems (FATS) has fielded over 5,500 systems to services in 52 nations. More than 300 weapons types, which comprise a mix of international small arms, are integrated into its systems. The most popular FATS system is the Small Arms Trainer, which supports individual marksmanship skills training, and team and squad-level tactical training.

One of the company's most recent developments is the FATS Bluefire Wireless Weapon Simulators. This option uses commercial wireless technology to communicate with the training system in the same manner as FATS Systems Controlled Weapons. Bluefire technology weapons products meet its customers' increasing demand to "cut the cord" between the weapon and the system infrastructure, and train with an untethered weapon. ([www.fatsinc.com](http://www.fatsinc.com))

- Advanced Interactive Systems, Inc., (AIS) offers its PRISim line of video-based judgment trainers employed for shoot, don't shoot decision-making and marksmanship training courses for both military and law enforcement agencies. A wide variety of small-arms weapons can be used in the PRISim products, which feature a considerable number of realistic combat and urban scenarios. One of the company's most recent products is the PRISim Portable Trainer Simulator, which provides the features of the company's larger simulators for smaller military unit, homeland security and law enforcement training applications. The PRISim line also has a Shootback Cannon option. ([www.ais-sim.com](http://www.ais-sim.com))


- DAS Electronics, Inc., offers its Bullet Sensor Livefire Trainer, which provides instant feedback on bullet strikes on paper targets at distances up to 1,000 yards. The lightweight, portable laptop computer-based system employs wireless, battery-powered acoustic sensors linked to a radio to provide impact feedback both to the user and instructor. The trainer is built for outdoor use, and can provide graphed shooting performance records and store them for performance review in addition to the instant feedback capability. ([www.bulletsensor.com](http://www.bulletsensor.com))



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